Exam 1a  50 minutes  Show All Work!  No Calculators

1) (30 points) Use the product and chain rule to differentiate, simplify, and find all critical points:

\[ y = x(x^2 - 1)^2 \]

2) (30 points) \( f(x) = (x^4 - x - 1)/(x^2 + x) \).
   a) Find the \( q \) to which \( f \) is asymptotic.
   b) Show \( f \) is asymptotic to \( q \) by computing a limit.

3) (40 points) Use the product and chain rule to differentiate, simplify, and find all critical points:

\[ y = x^2(x - 1)^2 \]